Wildlife
IN AUSTRALIA

4/-

BECHE-DE-MER — R. ENDEAN

LICHENS — R. FILSON

THE LAW OF THE JUNGLE — L. WEBB

REGISTERED AT THE G.P.O. BRISBANE FOR TRANSMISSION BY POST AS A PERIODICAL

THE COVER

Female Spotted Cuscus (New Guinea)
(*Phalanger maculatus*).

Photograph: David Fleay.

These large possums are distinguished not only by large size but by having about half of the outer end of the tail naked and covered by rasp-like scales.

They are slow moving, strong and have such small ears hidden in thick woolly fur that the head has a distinctive rounded appearance.

Though only two kinds of cuscuses have been recorded in the Cape York region there are a number of genera and species in New Guinea and neighbouring islands.

Natives find their flesh palatable and their fur useful.

Males and females of the Spotted Cuscus are so different in appearance as to appear unrelated and it is hard to believe that the sober animal of blue grey saddle in the picture has a mate of creamy white coat liberally blotched and spotted with orange, yellow and grey. Even the nose, skin, eye rims and toes are coloured.

Cuscuses are not idly named, being able to scream, snarl and bark as the occasion demands.

Their food consists of the leaves of trees, their bark and fruit, plus birds' eggs and even birds themselves.

A flourishing colony of cuscuses has lived over the past five years at the Fauna Reserve, West Burleigh, Queensland.

Seward's Natural History Books

FISHES OF THE GREAT BARRIER REEF AND COASTAL WATERS (Tom C. Marshall). £10/10/0. Post 10/-.
BIG BOOK OF WILD ANIMALS, compiled by Margaret Green. Ills. by J. Grabianski. One of the most successful children's books. £2/5/0. Post 3/6d.
THE EARTH (Arthur Beiser) Life Nature Library. Ills. Col. and B/W. £2/2/0. Post 2/6d.
THE UNIVERSE (David Bergamini) Life Nature Library. Illus. Col. and B/W. £2/2/0. Post 2/6d.
WITNESS TO THINGS PAST—Stone, Brick, Wood and Men in Early Victoria (John Hetherington) Ills. £2/5/0. Post 2/-.
IKEBANA AND BONSAI FLOWER ARRANGEMENT CALENDAR 1965—Day by Day. Col. and B/W Ills. £1/3/6. Post 1/3d.
WALKABOUT'S AUSTRALIA. Anthology of Articles and Photographs from Walkabout Magazine, Edit. by Bolton. Ills. Col. and B/W. £1/19/6. Post 2/-.
WILDFOWL CALENDAR 1965. Coloured photographs by Peter Scott. 12/6d. Post 1/3d.
WRECKS OF PORT PHILLIP (Peter Williams & Roderick Serle) Fully Illus. Maps, Photographs. £1/0/0. Post 1/-.
LIVING WORLD (Rutherford Platt) Miracles of Creation revealed in the world around us. Ills. £1/11/0. Post 2/6d.
SHARK HUNTERS (Ben Cropp) Ills. £1/17/6. Post 1/6d.
ALONG THE TRACK WITH CROSBIE MORRISON—Selection from his Nature Talks. £1/10/0. Post 1/6d.
BIRDS OF THE OCEAN (W. B. Alexander) Ills. £1/6/6. Post 1/6d.
VARDA, THE FLIGHT OF A FALCON (Robert Murphy) Ills. Moving story. £1/12/6. Post 1/6d.
WATERFOWL OF THE WORLD (Jean Delacour) Ills. by Peter Scott. 4 vols. £7/3/0 each vol. Postage extra.
ENCOUNTERS WITH AUSTRALIAN ANIMALS (Harry Frauca) Ills. £1/15/0. Post 2/-.
FLOWER ARRANGEMENT CALENDAR 1965 (Helen Van Pelt Wilson) Day by Day. 17/6d. Post 1/3d.
ANIMALS' WORLDS (Marston Bates) 100 Ills. in Colour and B/W. Beautiful book on Wild Life. £6/10/0. Post 7/6d.

We search the world successfully for rare and out of print books. Advise us of your requirements.

Also New and Secondhand Books on Australia, Pacific, Art, Natural History, Gardening, Orchids, Biographies and General Literature. Microscopes and Scientific Instruments available.

N. H. SEWARD PTY. LTD.

457 BOURKE STREET, MELBOURNE, VICTORIA
67 6129

WILDLIFE ADVISORY PANEL

AUSTRALIAN CAPITAL TERRITORY
H. J. FRITH (*Wildlife Research*)
B. P. MOORE (*Entomology*)

NEW SOUTH WALES
A. A. STROM (*Chief Guardian of Fauna*)

QUEENSLAND
R. ENDEAN (*Zoology*)
DAVID FLEAY (*Zoology*)
L. WEBB (*Ecology*)
D. H. WHARTON (*Entomology*)

SOUTH AUSTRALIA
D. E. POMEROY (*Zoology*)

VICTORIA
E. H. M. EALEY (*Zoology*)

WEST AUSTRALIA
D. L. SERVENTY (*Zoology*)
W. D. L. RIDE (*Zoology*)

Editor
B. CLOUSTON

Hon. Asst. Editors
L. WEBB, W. JONES
JUDITH WRIGHT MCKINNEY
K. MCARTHUR

Production
M. C. SMITH

Subscription
J. H. IRVINE

Members of the Wildlife Advisory Panel have kindly made their services available to the Editors to help in the collection of material and photographs for publication in *Wildlife* and to assist with their specialist knowledge where required. The Advisory Panel is in no way responsible for errors and inaccuracies in the contents of the magazine.

The Editors of *Wildlife* are constantly looking for articles and photographs on all aspects of nature and nature conservation in Australia. Please forward your articles to the Editor at G.P.O. Box 1173P, Brisbane.

WILDLIFE is published quarterly under the auspices of the Wildlife Preservation Society of Queensland by Jacaranda Press Pty. Ltd., 73 Elizabeth St., Brisbane. Any opinions expressed in this periodical are purely individual and the Society does not hold itself responsible for these opinions.

Annual Subscription 16/-, payable to Jacaranda Press Pty. Ltd., Box 1173P, Brisbane.

All correspondence should be addressed to the Editor at G.P.O. Box 1173P, Brisbane.

Printed in Australia by H. Pole & Co. Pty. Ltd., Brisbane. Registered at the G.P.O., Brisbane, for transmission by post as a periodical.

EDITORIAL

VOL. 2 NO. 3 FEBRUARY, 1965

WHAT PESTICIDES ARE DOING

IT is time that our Governments began to reconsider their cautious attitude towards the increasing use of pesticides and poison-baits in Australia. Not only because damage to wildlife and environments is proven, but because damage to man himself is quite inevitable as things are going now. We say this deliberately and with the utmost responsibility.

In a recent article in the *Sunday Times* of London, Peter Scott aroused a great number of concerned correspondents to give their views on this subject. In the article, he disclosed that in Britain, now, a ban has been governmentally imposed on the use of aldrin, dieldrin and DDT, and their derivatives, and on heptachlor, 'except for certain limited purposes'. Strict control, he says, will now be exercised on the use of other poisonous organochloride compounds. This move, after years of agitation and counter-claims by the companies concerned, followed research by British ornithological institutions and the Game Research Association; research which proved beyond doubt that the bodies of dead birds sent in from all over Britain, and from marine environments as well, contained lethal quantities of pesticides.

'No one doubts,' says Scott, 'that pesticides and herbicides must be used in the fight against human starvation and misery; but need they be used so crudely, so sweepingly, and so often without heed to the side-effects? Is it responsible to use high-pressure salesmanship in distributing such products?'

Letters to the *Sunday Times* following his article included, very significantly, one which pointed out that harmful pesticides of this kind are used 'in those countries from which we draw a large proportion of our own food supplies, both for human beings and livestock. This is a matter to which the Ministry of Agriculture and Food should give urgent and effective attention.'

Australia is one of the chief of those food-supplying countries. Would it not be better for us to act first, before our exported foodstuffs come under question, by making sure that they cannot be condemned as contaminated by dangerous poisons?

It has been proved that DDT, for one example, is stored in increasing quantities in human fat (in America the proportion is at present the highest in the world.) It will be immobilised there as long as the fat remains; but if illness or starvation, or even dieting, causes the fat to be reabsorbed into the blood-stream, the effect is to liberate the poison there at a time when the organism is weakest. Doctors in Australia have already drawn attention to the problem, in published work.

The point is that this is a cumulative poison. Year by year we are absorbing more and more of the organochlorides, and only time will tell what damage may be done. The counter-propaganda issued by chemical companies, if we analyse it, makes no prophecies whatever as to future effects; it speaks only of the necessity for the use of pesticides in agriculture and of the fact that damage is 'not proven'. But every year more evidence piles up against this.

The first indicators of damage are the carnivorous and insectivorous birds, the sensitive high links in the food-chain that leads from soil and plants through the eaters of seeds and grain and vegetation, upwards to the eaters of flesh and protein. What is happening to these birds of prey in Britain? Some are dying of direct poisoning, but even more alarmingly, others, while they survive the poison, are becoming infertile — their eggs, if laid, do not hatch. Scott gives numerous authenticated examples of this: the eggs, when analysed, contained pesticide residues which killed the foetus. Even sea-birds and fish, when analysed, were not free from this accumulating poison.

Damage *is* proven. We have the Kennedy Report, the British experiments, the experience of New Zealand (which has now strictly controlled the use of insecticides and pesticides), and mounting examples of damage from other countries.

As things now stand, we are steadily killing off agriculture's best friends — the insectivores — in favour of the very pests we are clumsily attempting to control; and in doing so, we may well be laying up trouble for ourselves for many years to come, and in directions we cannot possibly foresee.

WILDLIFE

VOL. 2 No. 3 February, 1965

CONTENTS

EDITORIAL 1

LEARNING FROM WILDLIFE 2
L. Webb

THE SPINY ANT-EATER 5
Colin Woolard

THE FUNNEL WEB SPIDER 6
Alan Anderson

LETTERS TO THE EDITOR 7

THE MOST UNLOVELY LADY 8
John Orrell

LICHENS 11
Rex Filson

THE WATCHING TREE 13
Ellen Miller

BECHE-DE-MER 14
R. Endean

AN UNKNOWN RED-TAILED QUAIL 16
Lloyd Nielsen

GWEN ATKINSON'S DIARY 18

BIRTH OF A MANGROVE 21
W. Jones

THE MIGRANT CURLEW 22
Elizabeth Kennedy

CHILDREN'S OBSERVATION PAGE 23
Michele Mercer

ALARM IN THE NIGHT 24
Lois Southern

OBSERVATIONS AND OUR COINS 26
K. McMullen

THE GREY SWIFTLET 27
H. C. Hayes

FUNNY FISHES 29
Arthur Mathews

REVIEW 30
K. McArthur

BILL JONES ANSWERS YOU 31

Back Cover

Learning from Wildlife

1. LAW OF THE JUNGLE

BY LEN WEBB

THE theory of evolution advanced by Darwin over a hundred years ago has penetrated and influenced the thinking of every civilised household. The ideas of historical change, descent of one species from another, and development of simple into complex forms are now accepted as part of our cultural tradition. They also underlie the practice of various biological sciences which aim to improve man's crops and flocks, to control disease, and to understand better the behaviour of man himself. The fundamental importance of Darwin's ideas in biology is matched only by the recent discovery of the genetic code by biochemists — the substances DNA and RNA which regulate our heredity at the molecular level within the living cell.

Yet the implications of Darwin's thought have by no means been exhausted, nor have some of the earlier crude misinterpretations of evolution been properly dispelled. One such is the law of the jungle — 'nature red in tooth and claw' — the survival of the fittest. It is reflected in the idiom of the harassed city-dweller who forces his way 'through the asphalt jungle'. These expressions conjure up visions of cut-throat competition and atavistic savagery in which only the strong are heroes.

In this emphasis on competition, antagonism among species and among individuals of the same species, one of Darwin's fundamental ideas has been overlooked: the interdependence of species.

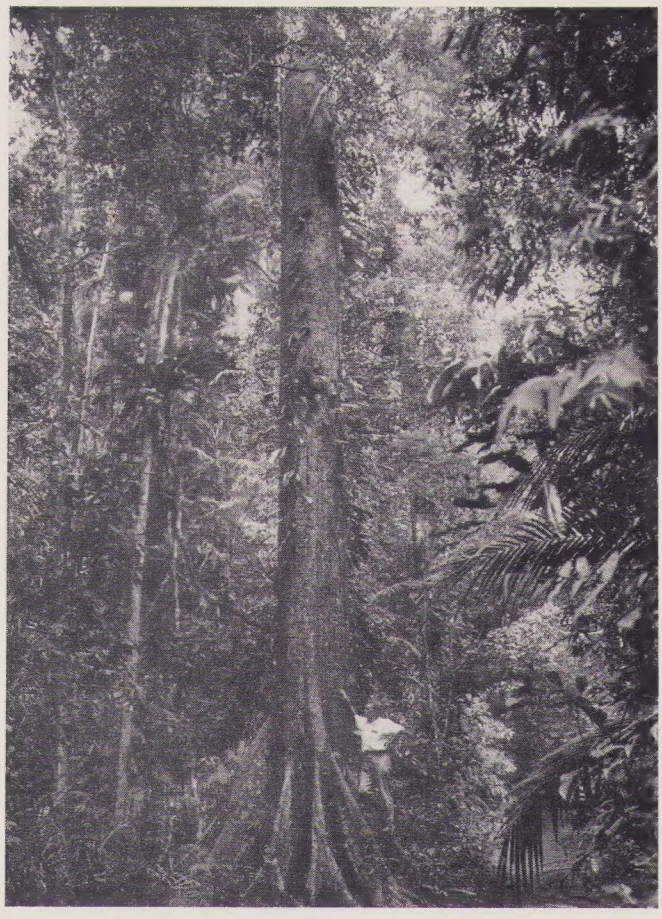
Nowhere is this interdependence more real, more highly organized, than in the jungle — the tropical rain forest. Enter the dim humid interior of a tropical rain forest, crammed with such a bewildering variety of life forms — among the plants are orchids, ferns, lianas, trees with plank buttresses and flowers on their stems, strangling figs, enormous palm and other divided leaves,

Tropical Rain Forest with Fan Palms, near Tully, North Queensland.

Photo: L. J. Webb.

'When we look at the plants and bushes clothing an entangled bank, we are tempted to attribute their proportional numbers and kinds to what we call chance. But how false a view is this! . . . The action and reaction of the innumerable plants and animals . . . have determined in the course of centuries the proportional numbers and kinds. . . . The structure of every organic being is related, in the most essential yet often hidden manner, to that of all other organic beings with which it comes into competition for food or residence . . . .'

—CHARLES DARWIN



Tropical Rain Forest with epiphytes, palms and plank buttresses.
Photo: Queensland Forestry Service.

parasitic flowering plants — and you are amazed that so many different species survive in such a restricted space. As an early traveller said, it is as though forest were piled upon forest.

On an acre of tropical rain forest in North Queensland there are over a hundred different species of trees, yet on an acre of eucalypt forest in western Queensland there is only a handful of tree species. More than one or two species of *Eucalyptus* rarely occur together anywhere under natural conditions.

Amazement at the ability of tropical rain forest species to tolerate one another under crowded conditions of competition gives way to a feeling that perhaps some of these species depend on one another and actually require the presence of others. Thus shade-tolerant ferns perish outside the shelter of the forest canopy, and tree seedlings of the climax forest will not establish naturally unless a layer of special humus has developed in the topsoil.

This feeling, which soon becomes a speculation, that some plants in the crowded jungle not only tolerate one another but also need one another is simply Darwin's idea of species interdependence. Relationships may be antagonistic (antibiotic) or favourable (probiotic) and sometimes indifferent.

Yet the question whether there is a specific and necessary relationship among certain species in nature, especially those high in the evolutionary scale, is one of the most controversial in modern biology.

It is a common observation in nature that plants and animals are not generally distributed at random, but form patterns which are characteristic of different places or habitats. These patterns can be expressed mathematically.

ARE these patterns simply the result of an accidental agglomeration of species which happen to get there, and whose physiology is suited to the particular conditions of moisture, light and food supply at that place? This means that species occur independently of one another — the so-called individualistic hypothesis. It is favoured by many American ecologists, beginning with Gleason.

The contrary view is that plants and animals occur in certain combinations, which can be identified by the presence of 'faithful' species, and in which the species interact to increase one another's potentiality for survival and regeneration. This is the community viewpoint, more popular in parts of Europe.

This question has not yet been satisfactorily settled. It engages the attention of many ecologists throughout the world and is providing fodder for modern computers. But it is not just an academic question.

How and why is the forest 'something more' than the sum of the individual trees which comprise it? If there are specific relationships among these individuals, are they physical, chemical, biochemical or biological? Has there been natural selection at the community level, as well as the species level, to produce these favourable adaptations?

PRODUCTION biologists organized in the current International Biological Programme (the biologists' I.G.Y.) are trying to discover how groups of plants under natural conditions produce such a bulk of living material (biomass) over an indefinite period of time. It is a delicate balance between organisms and environment which enables maximum exploitation of available resources without prejudicing this availability in the future. Man can achieve this only by continually adding fertilizers, irrigation, rotation of crops, breeding new varieties, and pest management. This is properly called conservation and is man's task for the future.

To accomplish this task, many inter-related questions must be answered which are vital to evolutionary theory. Why are the tropical humid zones occupied by a greater number of species of organisms than the temperate latitudes? Is the equatorial belt a cradle or museum of evolution? Why are complex groups (communities) of species more stable than simple ones? Why doesn't one or a few species become dominant in a tropical rain forest, as happens in an English oak wood or an Australian eucalypt forest? How is the great specific diversity of the jungle maintained, and how does this diversity — what Darwin called a 'simultaneous rotation' — ensure that the biological productivity of that habitat stays optimal?

Until man understands these laws of the jungle, and unravels the processes of energy transformation in simple and complex communities which, as Darwin noted, involve such essential and hidden relationships, he will fail to meet the challenge of the vast population explosion which now engulfs the earth, especially the tropics.

The Spiny Ant-Eater

BY COLIN WOOLARD

THIS is one of the two species of egg-laying mammals—the only two in the world—which form a primitive link with the reptiles from which all mammals are descended. The other species is, of course, the platypus.

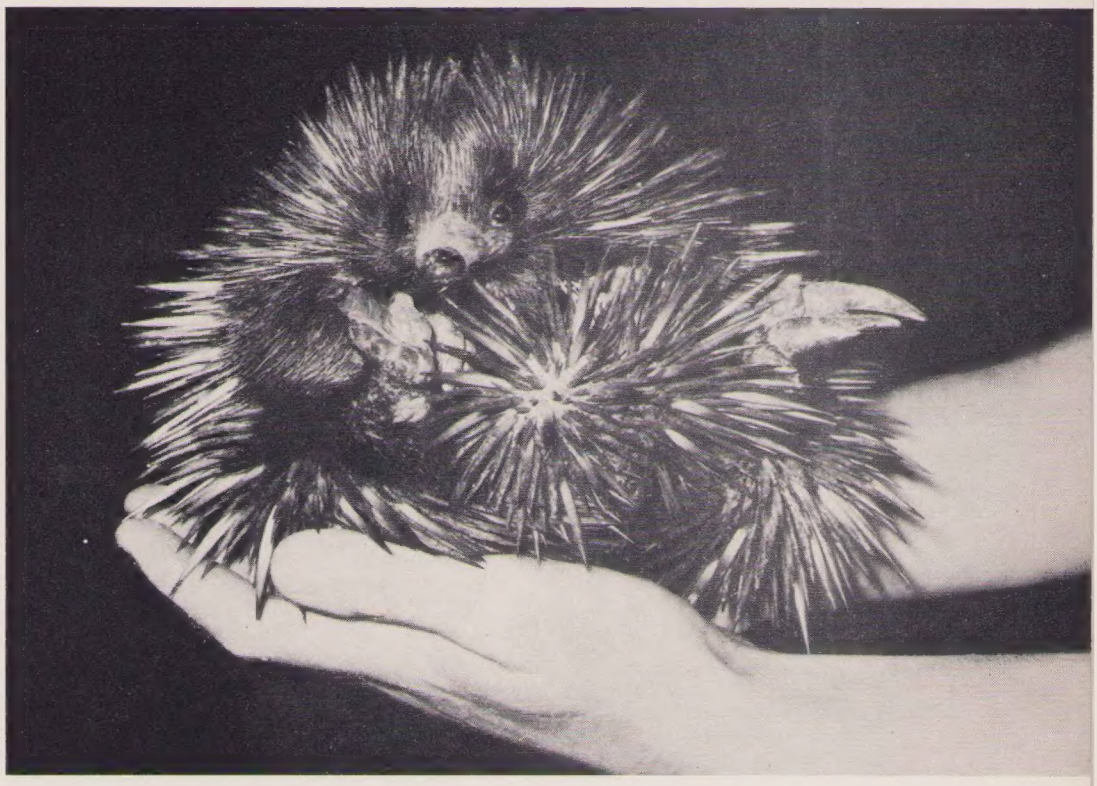
In view of the publicity given to the platypus, the spiny ant-eater is often overlooked and incorrectly called hedgehog or porcupine. It has no connection with either the American or European porcupines, both of which are really rodents.

The Spiny Ant-eater derives its name from the protective covering of quills (yellow with black tips), and its food habits. The quills are really specially developed hairs and cover the body, intermixed with a thick covering of black hairs. The snout is long and tapering with a small mouth at the end. Its scientific name, *Tachyglossus,* refers to the activity of its long sticky tongue which quickly darts out to catch any unwary ant.

When attacked or startled it digs rapidly into the ground letting the earth fall back on itself. Once in this position it is very well camouflanged and impossible to turn over without the aid of a shovel.

The ant-eater differs from the playtpus in that it does not tunnel, and the female carries the egg in a pouch. Later, when the young one hatches, she carries it round until it starts to grow spines. Then she leaves it in a hidden nest and returns from foraging expeditions to suckle it.

I was enlightened when I caught a young one in a suburban garden and in the short time I had it, I grew to like 'Spiny', as I called this topsy-turvy creature.



Spiny Ant-Eater (Tachyglossus aculeatus) showing the extended toe on hind foot. It is found only in Australia.

Photo: Barry and Joanna Morgan.

Digging-in, as a means of protection from most enemies.

Photo: Barry and Joanna Morgan.

SPINY was like so many other ant-eaters I have seen except he didn't have so many ticks. When I first tried to pick him up he resisted immediately by clinging with his spines and back legs while furiously digging with his powerful front legs. His eyesight was very weak and most of the time he kept his little piggy eyes hidden beneath a thick blanket of bristly hair. His nostrils were slits at the end of his snout and his sense of smell seemed to be very well developed. His hearing was also very good and one only had to click the fingers and he would roll up in defence. He loved milk and after drinking would emit squeaking noises, whether from his nose or mouth I couldn't find out. He had no teeth. Being nocturnal, he slept during the day. When grass got caught in his quills he used his second toe on the back foot, which had a long extended toe nail, to clean between the spikes.

We were very sorry when Spiky had to go, as Echidnas are rightfully protected although in days gone by they were a favourite food of the Aborigines. As Spiky shuffled off into Mt. Coot-tha Reserve, I was pleased that in the short time I had him, I was able to observe some of the little known habits of this mammal which will be featured on the five cent piece of our new decimal currency.

The Funnel Web Spider

BY ALAN G. ANDERSON

PICTURED beside a 620 film packet is a funnel web spider which was found under rubbish at Yeppoon on the Central Queensland coast.

Known as the genus *Atrax,* eight species are known to exist from Queensland to Tasmania.

Funnel webs are usually found under stumps or stones, in logs or in the ground near the base of trees where their burrows are protected by the root system of the plant.

The burrows are silk lined, though the silken tube may simply follow the crevices in the log or stump. So far, only two species of *Atrax* have been recorded as harmful to humans, one of these being the spider shown.

In 1952, a Gympie boy, bitten by *formidabilis,* was saved by the treatment of anti-venene and other means as quoted in the Australian Medical Journal for July of that year. The Sydney Funnel Web, however, has been responsible for eight known fatalities in the past.

Funnel Web Spider (Atrax formidabilis) pictured beside a 6x20 film packet.

Sir,

I wish to congratulate you on this fine magazine which makes such fascinating reading. Please find enclosed my annual subscription fee.

It took me by surprise to find an article on shooting. I did not think it possible a voice would rise to condemn our shooting habits. The licensing of all hunters has my full support, in fact, it is long overdue. Having worked in several places in the Riverina I know all about this hateful sport. The Riverina is one of the worst stricken areas. Noisy crowds looking in vain for wild pigs and kangaroos cool off their disappointment by shooting at anything. After all, what is the difference between a crow, a heron and a kookaburra? To hunt down an emu family by car is a highlight for every Sunday hunter. The success is celebrated with tins of beer around a campfire. Such a fireplace offers a wonderful scene after the gang has gone. It calls for the desperate need of controlling these reckless shooters. Unless a licensing system is introduced our native fauna will continue to suffer incredibly.

EGBERT HEROLD.

Sir,

Earlier in the year I told Mrs. McKinney that I would try to paint something for your magazine.

In 'Wildlife', September, 1964, page twenty-four, you show a nest of young Willy Wagtails labelled 'Peewees'.

The enclosed sketch shows a peewee chick. I also enclose a note about its markings.

I much appreciate the effort you are making for conservation and if I can help with occasional bird pictures I will be glad to do so.

Would you like a few sketches on how to draw birds?

Peewee or Magpie Lark Chick

It has different markings from its parents. Forehead, face and eyebrow are like the male bird. White chin and throat as in the female. Unlike its parents it has a dark bill.

BETTY TEMPLE WATTS.

Sir,

I read with interest the letters in the June issue of 'Wildlife', but fail to understand Mr. Passmore's remark regarding the Golden Bower Bird. He states, 'Having surveyed these areas rather intensively, I can assure you that the likelihood of finding the species in the Crater area is very remote.' I do not quite know why he states this as I have seen Golden Bower Birds at the Crater on two occasions with a bower very close handy. This bower and the owners have been seen by numerous field ornithologists from many parts of the country and overseas and I know that Mr. Bravery has also found several other bowers with birds in other parts of the Crater area. Incidentally the location of the bower near the Crater is only conveyed to people who are known to be keen 'birdos' and ones not likely to damage it or in any way disturb the birds.

MARION L. CASSELS.

Sir,

The article on the Albert Lyrebird in 'Wildlife', June, 1964, was most interesting. There are several pairs of these birds on Tamborine Mountain, and we hear those in the National Park in front of our house calling right through the summer, but not so frequently as in winter.

The Satin Bower-bird is also a good mimic, but only odd individuals in the flock seem to have the 'gift.' Their favourite mimic is the Crested Hawk.

At the present time an adult male Bower-bird favours us with quite a repertoire. He sits in the loquat tree ten feet from the verandah to give his performance.

One afternoon we heard what we thought was the Pied Butcher-bird (*Cracticus nigrogularis*), so we put his favourite bits of cheese on the rail, but he did not come for it. Then we noticed the male Bower-bird in the loquat, and realized he was imitating the Pied Butcher-bird. As we sat watching he mimicked a Crested Hawk, a Bar-shouldered Dove, a Pied Currawong, and some notes of the Kookaburra, though not its laugh. The two last imitations were in softer tone than the originals. The following day he added the sounds of a mob of Noisy Miners, and the warning call of the Eastern Whipbird.

ALIX UPTON.

Sir,

It is unfortunate that Arthur S. Roe in his otherwise commendable article 'Hunting for a Trophy' ('Wildlife', Vol. 2 No. 1) gives cause for some concern.

First he tells us that when photographing a nesting bird he breaks off the surrounding branches. This is not to be encouraged.

The bird chooses its nest site for the cover and protection it affords. By removing some of that cover the risk of predation is increased. The most that can be condoned is to tie back unwanted vegetation until photography is completed.

He later records that nestlings were taken out of a nest and placed in a felt hat in order 'not to be denied our trophy'. In this case the nestlings were apparently quite small and so they returned to the nest without trouble. However, it should be pointed out that nestlings approaching the 'nest-leaving' stage are often difficult, if not impossible, to put back into a nest once disturbed.

I hope that few potential nature photographers have been misled by the article. I urge them to become naturalists first and only secondly photographers.

As I see it a nature photographer has a primary duty to ensure the welfare of his models as, I'm sure, Mr. Roe would agree. If it is necessary to interfere with wildlife in order to secure a photographic trophy, the better nature photographer will await a more suitable opportunity.

By so doing he will, incidentally, obtain a trophy of which he can really be proud.

IAN GRANT.

Sir,

I have just received the July issue of 'Wildlife' and was reading with great interest the article by Mr. Arthur Roe entitled 'Hunting for a Trophy'. Of special interest was the section on camouflage and in particular the mention of the Mopoke or Tawny Frogmouth.

I myself am not really a naturalist in the true sense of the word, but I am a very keen photographer and find all birds and animals fascinating subjects. I think that the two slides enclosed illustrate Mr. Roe's points that the Mopoke is certainly the greatest camouflage artist and has a resemblance to the Owl.

These two photographs were taken on Paratoo station about 40 miles north-east of Peterborough. I use a single lens reflex camera and both pictures were taken with the normal 30 mm. lens. Unfortunately, I don't have a large telephoto lens, which I think would help a lot in this type of work.

I was most impressed by the fact that these birds chose a pepper tree in which to roost, although surrounded by many higher and what would appear to me much safer red gums. The friend who showed me the birds mentioned that there have been Mopokes in the same tree for seven years to his knowledge. Of course, whether they are the same ones or not we would have no idea.

I trust that this letter and the slides will be of some interest to you and you may use them as you think fit. However, I would like the slides returned as I have no duplicates and I would not like to lose them.

The whole family enjoys your magazine very much. Thank you for the interesting reading, beautiful photographs and very thought-provoking editorials.

D. ROSS LLOYD.

"A MOST UNLOVELY LADY"

BY JOHN ORRELL

The Black and White specimen from South Johnstone.

Male Phasmid—wings at rest.

UGLY blighter, ain't she?' My visitor extended a cardboard box containing exactly what he had described — an 'ugly blighter' — and asked for identification.

A distended six-inch body, supported on legs which flattened out to simulate a leaf; bug-eyes, centred with black pupils; and a general air of self-satisfied smugness characterised the insect, and although I had never actually seen one, I was able to tell my visitor that the specimen was a relation of the Praying Mantis and was generally known as the Spiny Leaf Insect. Reference to McKeown and Tillyard placed her as belonging to the family Phasmatidae, super-family Phasmatoidae, genus *Extatosoma* and species *Tiaratium*.

I photographed her, and published her picture in my regular 'Nature Notes' as a curiosity, having taken note from the original finder that she had remained 'practically stationary' on a rose-bush at Port Douglas for two weeks.

This, three years ago, was my introduction to the Spiny Leaf Insect, and since then, we — my son, daughter and I — have learned a lot about these curious and harmless creatures, and still have a few unsolved questions to answer.

Publication of the picture brought an immediate response from Mr. Peter Kenny of Herberton. He had 'Phasmids' on his rose-trees and also on the guavas. They appeared to do little harm, and there was a whole family at my disposal should I require them!

Good Friday saw a family party making the 200-mile trip to Herberton, to return with a portly lady and six nymphs — all from the guava bush. Peter was emphatic that the creatures were definitely 'one-tucker' insects, remaining only on the type of feed under which the eggs had hatched. A 'Rose Phasmid' would starve to death on a guava, and a 'Guava Phasmid' would refuse to eat rose leaves!

Daughter christened the mature female 'Belinda', and the whole family was established where observation was easy and practicable. The matronly old dame produced a daily egg which she dropped willy-nilly into the compost beneath the tree. The young nymphs rapidly became lost to sight — so nearly do they resemble a withered leaf it is almost impossible to detect one after it has been liberated.

And then reports from other readers began to come in. From Mourilyan came a parcel of a dozen or so eggs — seed-like capsules with which we were by this time familiar, and these were placed in a bottle on my desk. The accompanying letter said that the insects stuck loyally to a 'Bird-of-Paradise' bush.

Then one day, during April, a year after the arrival of the original stock, Daughter announced that 'Belinda has a friend!' Sure enough, a mature female was

ensconced on the guava, and the original Belinda, now weak and obviously senile, disappeared a few days later.

'Belinda II' was a slimmer version of her elder sister, and developed the same lethargic habits — remaining on the older leaves of the guava, eating sparingly, and becoming a sight for visiting tourists.

Her vestigial wings precluded flight, and she seemed to spend her days in contemplation of the leaf in front of her, occasionally nibbling a little, but never enough to place her in the 'insect pest' class.

Then, one day when I was at work, the phone rang. Great excitement at home! A male Phasmid had arrived and was paying court to Belinda II! Praying that he would be there at 5.30, I hastened home and was successful in capturing him for the collecting bottle.

Slim, a hundred and twenty centimetres long, with the same leaf-like legs as his spouse, he was possessed of gauzy diaphanous wings of exceptional beauty and (we found later) capable of sustained flight.

Having mated our first pair, the male became a martyr to science, and ended up as a specimen in the collection. A couple of weeks later 'Belinda II' produced her first egg and continued to repeat the performance daily for some months — right throughout the spring and summer, in fact.

At this time, I missed the bottle of eggs which had been sent from Mourilyan, and enquiry showed that they had been knocked over and lost — no doubt swept up and taken outside with the other contents of the dust-pan.

Close up of head of female.

Photos: John Orrell

SHORT paragraphs on 'Belinda's' progress appeared in my 'Notes', and readers supplied many details regarding their habits outside the district — one reader becoming alarmed that I was encouraging Phasmids, and quoting 'Murphy's Ringbarkers' as a dread example. I was able to reassure him that although the 'Plague Phasmid', so pestiferous in Victoria that helicopters have been used to stay its depredations, was a relation of 'Belinda', it was of entirely different habits and unlikely to establish itself in North Queensland.

By the time 'Belinda III' had taken possession of the guava tree — strangely enough, although we counted scores of nymphs after a hatch, seldom did more than one or two reach maturity — mature females were seen on the comquat, the mandarin and the 'flame tree' — a species of currajong — in the house garden.

Our Flame Tree phasmids proved to us the 'one-tucker' habit of this strange insect. The shrubbery at the foot of this tree had a small comquat (clue to the disappearance of the overspilled eggs — my wife empties the dust-pan at the foot of this tree!) and Belinda's relations had become well-established therein.

At leaf-fall, and just before the tree takes on its glorious riot of encarmined colour, it stands bare and solitary, holding leafless limbs to the elements. It was then that Daughter noted two Phasmids high in the branches. Nothing would persuade them to move, although Son rescued them and we tried to make them take either guava or mandarin as a host. Only the Flame Tree would do for them! And they literally starved to death!

I thought that I had the life history (quite a common one) of the insect well tabulated. The flightless female mates with the winged male; eggs are scattered willy-nilly beneath a suitable host-tree, and the nymphs hatch as the warm weather approaches. Birds and insect predators thin out the nymphs, and a few mature females are left to carry on the race. Apart from their likeable ugliness, their attraction for tourists who had never seen one, and the difficulty they presented in obtaining a suitable photograph, I thought that no unanswerable question regarding their life had been propounded during the three-seasons observation.

Unlike the Phasmid, which scatters eggs willy-nilly, the Mantis spins a cocoon for her eggs and attaches them securely to a suitable host. Picture taken at 5 a.m. with available light.

Until I had a letter from Ravenshoe on the Tableland. 'I'm sending you one of those phasmid things,' my correspondent wrote. 'There were two last night — one much slimmer than this one, and I put them both in the same bottle. This morning there was only this one, and shreds of the other. However, I thought that you may be interested.'

Unfortunately, my correspondent didn't send the bits and pieces!

Prima facie evidence points to the mantis-like husband-murder, *but* . . . Some time ago a lad brought me a long wire-like worm, saying that he had 'flicked at a mantis with a piece of rope and the worm had fallen out!' A helminthologist confirmed this, by identifying the worm as one of the Gordias — parasitic to the mantids and often occupying the whole of a mantis' interior before bringing about the creature's death.

So I am still in doubt as to whether the uncomely lady actually eats her husband. Certainly the matings I have witnessed have all resulted in the winged Lothario's getting clean away, but whether this would happen in an enclosed space is a question to ponder.

The report of the Gordia and the Mantis had a strange sequel. From Cooktown came a letter from one of my oldest and most valued observer-correspondents, Stanley H. Boyd. Recalling an incident of over 60 years ago he wrote: '. . . it was raining and whilst we were resting, Dad with his "Register" and I with the "Chatterbox Annual", an extra large mantis flew into the lamp, and to save it from getting burned, Mum put in into a tall glass water-jug, and put a book on top of it. . . . In the morning she took the book off, and there was a foot or more of what looked like a piece of thin wire, and bits of what we called the "Ladybird" (mantis) scattered around. We came to the conclusion that the "wire worm" had been in the jug and had killed the mantis. I've been waiting for 60 years for the right answer to that one, and have at last found it through the "Notes"!'

Male Phasmid — extended.

Photos: John Orrell

"Belinda 1" — a most uncomely lady.

PLEASED as I was to be able to solve a 60-year mystery through correspondents, I am still left with the mystery of the murdered phasmid. Gordia or wife? — Who killed Cock Robin?

Although the majority of leaf insects which have been brought to me have been either green or brown, a most interesting specimen was shown some two weeks ago, when a creamy-white female with black points was produced for identification. Anxious to explain this phenomenon, I traced the host-tree to South Johnstone, near Innisfail (N.Q.) and found a mandarin well infested with the black and white fungus so common to northern citrus. In the collecting jar, with green mandarin leaves for food, the specimen took on a faint green hue before shedding her skin to become once more a black and white specimen. An effort to transplant her to my own mandarin tree failed — unless during the week that I have been away she has donned Lincoln green and sought refuge amongst the deeper branches.

During the coming Summer we intend to establish yet another generation of these interesting insects in a properly protected insectary, detail their life's history completely, and settle once and for all the doubt concerning whether or not the male is also the wedding breakfast.

ADDENDUM

Since completing the foregoing, a male phasmid arrived at the Insectary — there being three females ready to mate — and this specimen was placed, with an unmated female, in a glass observation cage.

Mating took place and the insects were left together overnight.

The female made no attempt at any time to attack or devour the male, and in the morning both insects were very active, the male making every endeavour to find an outlet to the cage, and the female assuming the characteristic swaying pose peculiar to her kind.

I can only assume that the insects are not carnivorous during mating, and that the Ravenshoe specimen was probably the victim of a parasite. Observations made between 12th and 14th October, 1964.

LICHENS

BY REX FILSON

Part One

WHENEVER we converse on interplanetary travel we often muse on the possibility of life on the other planets. Photographs have already been taken of the surface of the moon and it is hoped to photograph the surface of the planet Mars early in 1965. Scientists have long wondered if life does exist on this planet, and when we discuss this possibility, lichens enter the conversation.

These unobtrusive plants are found in the most forbidding environment of our planet. They can be seen growing on rocks just below the snow line on the mountain peaks, on rocky nunataks not far from the North and South Poles, in constant temperatures near and below freezing, and at the other extreme they can be found in the Central Australian desert growing on rocks too hot to place one's hand on. They can be found at the tops of the highest tropical trees where the blazing sun is too strong for competitors, or they may be found at the bottom of the same trees where other plants are ruled out by excessive moisture or shade.

Lichens grow very slowly and certain lichen colonies have been estimated to be more than 2000 years old. Comparison was made recently of lichens growing on a cairn in Antarctica, with a photograph taken when the cairn was erected 30 years ago, and they had not spread to other exposed surfaces of the cairn in that time.

Lichens are often mistaken for mosses, but the term 'mosses' is popularly used to include many unrelated plant. Certain species of the lichen genus *Cladonia* are known as reindeer moss, notwithstanding the fact that they lack stems and leaves so characteristic of the true mosses. Irish moss is an algae found in the shallow coastal waters of Northern Ireland. The Spanish moss of California is a lichen *Ramalina reticulata.*

Lichens themselves have a very unusual biological makeup. A lichen is not a simple plant but two entirely different and separate individuals, living together in such a balanced relationship that they not only form a successful organism but are able to reproduce themselves. One component is a fungus, this is usually an ascomycete, but in a few cases it is a Basidiomycete. It is the intertwining of the fungal hyphae that gives the form to the lichen thallus. The second part of this relationship is a species of green or blue-green algae. The algal cells are found enmeshed in the hyphal strands of the fungus. These then form a particular species of lichen each with its own specific, morphologic, taxonomic, ecologic and sometimes physiological characteristics. The fungal part of the thallus grows by the extension of the hyphae and the algae cells by division. Of these two components, the algae have remained the least modified by the association, they belong to the air-living groups of the green or blue-green algae, and so far as is known, all can and many probably do exist independently in nature. The fungi of this association, however, have never been found in nature independent of their algae.

This relationship between the fungi and the algae is a physiological union and is usually regarded as one of symbiosis; that means that they are of mutual benefit to one another. The fungal part gets its food from the photosynthesized cells of the green algae and the algae benefit by being protected from the elements and by the fact that it has its moisture and mineral nutrition maintained by the fungal hyphae in the thallus. The fact that haustoria is present and that fungal hyphae do penetrate into the algal cells, indicates that this relationship is merely a case of the fungus being a controlled parasite on the algae. Many of the fungi are parasites anyway, like animals they have to depend on plants that

can conduct the process of photosynthesis for their existence. Many fungi live on decaying vegetation, which is derived from photosynthetic cells. The lichen fungus is far more sophisticated because it has incorporated its photosynthetic plants, the algae, into its own structure.

LICHENS are really a highly specialised form of fungi; the geological record does not tell us much on how lichens evolved as they do not fossilize readily. They seem to be a relatively recent product of evolution and are not a primitive group and this fact argues against them being found on Mars.

Lichens have been put to many uses, both by nature and by man. The American Caribou and the Old World Reindeer have practically an exclusive lichen diet. In winter they feed in the snow-free areas or paw away the snow cover to get at the lichen underneath; in summer they migrate to the highlands or close to the coast, partly to avoid insect pests and partly to feed on fresh pastures. This constant natural rotation from the lowlands to the highlands prevents overgrazing in any one part of the country. The most useful species for grazing are the so-called 'reindeer mosses' or lichens, *Cladonia rangiferina, Cladonia alpestris* and *Cladonia sylvatica.* These lichens grow in carpet-like masses to a height of six inches. In many of the damper areas in Australia you can find *Cladonia retipora* or the Coral lichen growing to these proportions, though not, of course, covering the same acreage.

From the earliest of times the food of man has included lichens, sometimes as a delicacy, but more often as a last resort in the face of starvation. In general the acid content of these plants gives them a bitter and unpleasant taste and unless removed makes them unpalatable and can cause inflammation of the digestive tracts in man.

Cetraria islandica probably rates highest as a lichen food for man. It is gathered commercially in the Scandinavian countries and in Iceland is sold on the markets as "Iceland Moss." This is crushed into grain meal and from this flour they make bread, gruel, porridge, salads and jelly in various ways. Also when mixed with flour and made into bread it is less susceptible to weevil attacks. Before use the lichens are boiled in lye, rinsed in clear water and dried. When prepared in this way they will keep for many years.

THE Biblical manna of the Israelites appears to have been *Lecanora esculenta,* which is still eaten by the desert tribes. This lichen grows in the mountainous regions and is blown loose into the lowlands where the thalli pile up into small hummocks in the valleys.

In Japan, *Umbilicaria esculenta* is considered a delicacy and sold as 'iwa-take' or rock mushroom.

In India, *Parmelia abessinica* is used as food, generally in a curry powder or medicines.

Use of lichens instead of hops for the brewing of beer has been mentioned as having occurred in one or more of the monasteries of Russia and Siberia which had the reputation of serving bitter and highly intoxicating beer to travellers.

Alcohol production from lichens is an old art. In 1868 a report was published on the production of brandy from lichens and this included the plans for the setting up of a distillery with the figures of possible production levels. It was claimed that 20 pounds of lichen would yield 5 litres of 50% alcohol.

Lichens have also been used for tanning and dying for cosmetics and perfumes.

REFERENCES

Lamb 1959, Lichens, Scientific American.
Llano 1948, Economic uses of Lichens, Economic Botany, Vol. II. No. 1.

"The Watching Tree"

BY ELLEN MILLER

WEST Australia, and a dusty red road somewhere near Meekatharra.

We had a map showing possible places for acquiring water. The next one was about half a mile from the road, a rusting tank, an outsize windmill, silent and still, and a long shallow stone trough. A thorny bush about five feet high — a 'tree' in this almost treeless country — struggled for life about fifty feet from the trough. The sky was almost white-hot.

We'd have lunch first, we decided, then fill our water containers. It was while we were eating that we became aware of a commotion of birds. An unhappy commotion — finches and doves, landing on the tree, then flying round the tank and trough, twittering a feeling of distress and desperation.

At first we thought our presence was upsetting them. Then Margaret realized the significance of the stillness of the windmill. She was right. Both tank and water trough were dry. And this was possibly the only source of water for these birds for many miles.

The windmill, like several others we had seen, was equipped with an ingenious device to enable it to turn itself off when the water level was within a few inches of the top of the tank. This device looked as if it had been deliberately broken. It took Margaret a long time to repair it and get the mill clanking round again. A few birds twittered uncertainly in the 'tree' as she worked, a few flew above her, but most of them disappeared.

Slowly the water began to run, just a trickle at first, seeping into the trough. We went back to sit in the car and watch.

Within minutes, the birds began to arrive. Soon it was as though there was a bush wireless at work among all the birds in the vicinity! They wheeled around the tank, then landed on the thorny tree. It was a tree alive with birds, birds that watched for a minute or two, looking for possible danger, then swooped down to the edge of the stone trough.

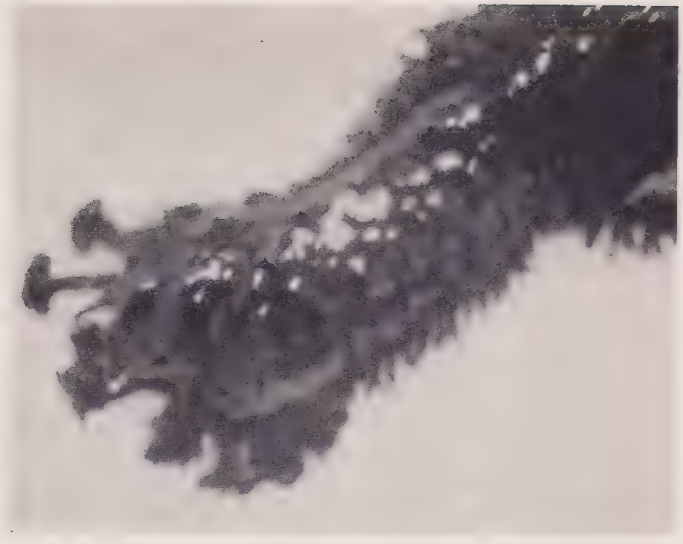
WE sat in the car, and great clouds of birds arrived, settled on the 'watching tree', then flew down to jostle each other at the trough. They were mainly small birds, finches of many kinds and colours, twittering and scolding, beautiful grey-blue peaceful doves, and several others of whose names we were uncertain. They came, drank, and left again. But we noticed that as they arrived most of them landed on the tree and looked around before coming down to the water.

This country which we had heard described as 'empty' will never now be empty for us, for it seemed, suddenly, a country of birds.

We sat for nearly an hour, then went out to fill our water containers. As we did so, the remaining birds sat in the 'watching tree', keeping an eye on us, ready to descend again to the water trough as soon as we departed.

Beche-de-mer

BY R. ENDEAN



Negatives of anterior end of Holothuria leucospilota.

VISITORS to a coral reef are usually intrigued by large sausage-like objects scattered in pools and on the tops of coral platforms. The objects appear inert, and are drab and slimy. If one is picked up, it hangs limply from the hand for a period whilst a stream of water pours from an opening at one end. From this same opening, sticky white threads may then be extruded. This extrusion is accompanied by a visible contraction of the body wall musculature of the animal — for animal it is. Soon the major part of the animal's internal organs may cover the observer's hand with a sticky mess. After such an experience, the casual visitor's interest in these animals, known as *holothurians* or *sea-cucumbers,* quickly fades.

Holothurians bear little external resemblance to their elegant relatives the starfish, feather-stars, brittle-stars and sea-urchins, but all of these animals have sufficient structural features in common to be placed in one large group known collectively as echinoderms. About 900 species of holothurians are known and, of these, about 170 occur in Australian waters. Although the bulk of the Australian species is found in tropical waters, holothurians are by no means rare along the shorelines of the southern half of the continent. Moreover, a number of species is confined to the ocean deeps and a few species, which are unusual in that they possess swimming membranes, are pelagic.

Great variation in size is exhibited by different species. Some, such as *Stichopus variegatus,* may attain a length of three feet and a diameter of six inches and resemble small logs. Others, such as *Synapta maculata,* are up to six feet in length and resemble snakes. At the other extreme are inconspicuous species which are less than an inch in length. Many holothurians lie completely exposed on the sea bottom but some habitually seek the shelter of slabs of rock or coral and a few burrow in sand or mud. The conspicuous mounds found commonly at low tide on many beaches in tropical Australia are produced by a burrowing holothurian.

Usually, holothurians are brown or grey of some shade but some species are white and some almost black. A few are conspicuously coloured. *Pseudocolochirus axiologus,* for example, is longitudinally striped with bright red, blue and yellow. The body wall may be tough and leathery or thin and transparent. It may be covered with bumps and pointed protuberances or it may be smooth. Within the tissues of the body walls of all holothurians are limy spicules. These tiny spicules assume an amazing variety of form. Some spicules are shaped like buttons with two, four, six or eight holes. Others are shaped like open-weave baskets, rosettes or tables. Some have a simple rod-like shape but others bear marked resemblances to miniature anchors or spoked wheels. The types of spicule present in one species are characteristic of that species and the correct naming of a species often depends upon the types of spicule present.

A Holothurian which has ejected Cuvierian tubules on to hand.

MANY holothurians possess on their lower surfaces hundreds of little tube-feet which are used for locomotion. These tube-feet are actuated by a type of hydraulic system. Other species move by means of a creeping sole resembling that possessed by a snail, still others move by wriggling. Feeding is accomplished by means of extensible tentacles which fringe the mouth. The mouth is found near the anterior end of the body. Usually holothurians move very slowly over the sub-

stratum, sweeping the area ahead of them with their sticky tentacles. Alternatively, they may shelter beneath a rock or clump of coral and sweep the area in their immediate vicinity with their tentacles. In either case, particles of sand, mud and detritus together with minute organisms adhere to the tentacles. Each tentacle conveys adhering material to the mouth where it is swallowed. Of course, most of this material cannot be digested and is moulded into pellets which pass from the animal via an opening at the posterior end. It has been estimated that the population of 2,000 holothurians inhabiting each acre of a coral reef collectively pass about 60 tons of sand and other bottom material through their digestive tracts each year. Not all holothurians feed in the manner just described. Many burrowing species simply sit in holes which they have made and hold up their tentacles in the form of a funnel. Detritus from the water above them rains down into these collecting funnels.

GILLS are not possessed by holothurians and water for respiratory purposes is pumped in and out of a cloacal chamber found at the hind end of the animal. It is of interest that small slender fish (species of *Cerapus*) shelter within the cloacal chambers of several of the larger species of holothurians found on coral reefs. Sometimes these fish eat some of the internal organs of holothurians but this does not result in the deaths of their hosts because the latter have the ability to regenerate their internal organs.

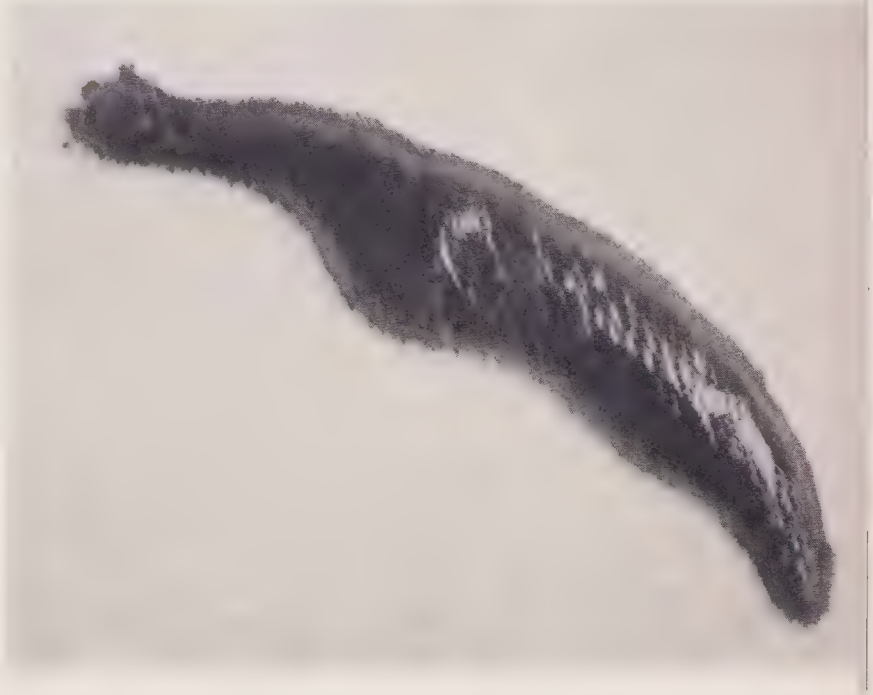
When molested, many holothurians throw out threads via their cloacal chambers. These threads, which are termed Cuvierian tubules, elongate rapidly in sea water and become extremely sticky. They are organs of defence, for their adhesive properties are such that predatory crabs and fish coming into contact with them are completely entangled. Moreover, the threads are very strong because they each contain a core of collagen fibres. Such fibres are present in our own bodies, where they form the structural basis of connective tissue. The collagen fibres of Cuvierian tubules and the cells which form these fibres can be readily isolated and can be obtained in quantity. Important information on the mode of formation of collagen fibres is being obtained at the University of Queensland as a result of studies made upon the Cuvierian tubules of holothurians.

ANOTHER reason why biologists and chemists are interested in holothurians lies in the fact that certain species contain toxic materials in their tissues. Some species are, in fact, chopped up by natives on certain Pacific islands and the pieces thrown into pools. Fish in the pools are poisoned by the toxic products liberated from the holothurian tissues and are then collected. The natives apparently suffer no ill-effects from eating fish captured in this manner. Species belonging to the holothurian genus *Actinopyga* are noteworthy because they throw out, when molested, red Cuvierian tubules which are non-sticky. However, these tubules contain an extremely toxic material which kills any fish which eats them. A chemical called holothurin has been isolated in the U.S.A. from the tubules of *Actinopyga agassisi* and this chemical is of particular interest because it has caused regression of certain tumours in mice.

Great powers of regeneration are possessed by holothurians. If stimulated sufficiently many will throw out the greater portion of their internal organs. Regeneration of these organs occurs within a few weeks. Regeneration in echinoderms generally is being studied in many laboratories because, apart from their intrinsic interest, such studies might throw light on the reasons why certain of our own organs and bodily structures can, if necessary, regenerate whilst others cannot do so.

Holothurians are collected, eviscerated, cooked and dried in the sun. Thus prepared, they are known as beche-de-mer or trepang and they form a gelatinous base for soups much favoured by oriental peoples. Usually, only the larger species of holothurians are used for beche-de-mer and some of these specimens have been given trade names such as sand fish (*Holothuria scabra*), tiger fish (*Holothuria argus*) and lolly fish (*Holothuria edulis*). Thursday Island in Torres Strait was, early this century, the centre of a flourishing beche-de-mer industry. The demand between 1920 and 1935 by Chinese sources for beche-de-mer was such as to exhause the supply that was easily accessible in the Torres Strait region. For a variety of reasons, this trade in beche-de-mer has been revived only partially in recent years and, in the interim, the holothurian population has increased considerably. Nevertheless, it is evident that if the trade regains its former importance some regulation of the annual catch of holothurians in the region will be necessary.

A Holothurian (Holothuria leucospilota) found commonly in the Great Barrier Reef.



An Unknown Red Tailed Quail

BY LLOYD NIELSEN

THE days for discovering species of birds unknown to science on Australian soil are over,' a few hard-headed ornithologists have repeatedly stated. It seemed as though they were right — that is until a short time past when a new species of Babbler was discovered in a remote area of Queensland.

Perhaps in the not too far distant future they may once again be proved, for over the past thirty-odd years, a quail, unidentifiable from available literature and unknown to the few bird men who have seen it, has constantly been reported.

Theories were put forward as to its identity—theories such as 'subspecies of a known quail,' and 'colour phase of a known quail.'

None of the Australian Quail have brilliant colour features (though the King Quail is the most colourful) and in flight most display drab shades of brown which make some of the smaller species indistinguishable in the air.

Yet here is a quail, almost black in body colour and showing a vivid blood red tail in flight—in fact such that one might think, as did two farmers recently, that the bird's tail had been severed!

Unlike nearly all other quail, its habitat preference is for rich, green growth, mostly clover and lucerne.

Could it be one of the known quail?

The question may be asked, 'Why was it not collected by professional ornithologists many years ago?' Probably habitat preference is one of the factors for this. Even the most diligent collector of yesteryear probably would not have considered tramping through some farmers' lucerne patch or spending valuable time searching lush green growth — an 'unlikely' place for quail.

Secondly, the excursions of ornithologists have been limited in the areas from which the quail has been reported. Again, the quail is apparently very rare and hard to flush. Indeed, the chances of procuring such a bird were slim!

The first ornithologist to report the quail was the late Mr. E. A. R. Lord, when numbers were located in lucerne on his Murphy's Creek property in Southern Queensland nearly forty years ago.

He recorded his sightings of this unique quail in the pages of the 'Emu' where little interest was taken.

However, this bird was destined to reappear again to someone keenly interested in birdlife, this time forty miles south of Murphy's Creek and thirty years later — at Inverramsay.

And so it was that, while harvesting sudan grass with an understorey of lush clover, I flushed many of them. This record, again published in the 'Emu,' caused some mild interest but it, too, began to fade into less than a memory. The answer may have been provided shortly after the birds were seen but I had previously arranged to be in another district the following day and for a considerable time after, thus depriving me of the chance of examining an individual of this quail.

Then, after five years without a report or sighting of the quail, two of us conceived the idea of appealing through the press for information and sightings of a 'quail with a brilliant red tail.' Our hope was that such information would lead to the trapping and examining of one of these elusive birds.

LETTERS were sent as far south as Port Macquarie in New South Wales and north to Gladstone in Queensland. If luck was with us, we thought, we may get a reply, perhaps two or three if we were very lucky.

Our judgment was far out, for no less then twenty replies were received. Perhaps it was our readiness for disappointment, or the thought that it may be only wishful thinking to hope for a number of replies that caused us to underestimate greatly the number received.

Twenty sightings! How heartening this was! At least our red-tailed quail still existed.

Most of the sightings came from the coastal side of the Great Divide, several from the eastern Darling Downs, a few from Northern New South Wales, as far south as Port Macquarie, and two inland at Moree. Seven were recorded within the previous few months from when the appeal appeared.

Since these letters were received, these birds have been seen on the Atherton Tableland and in Innisfail, Northern Queensland.

Amazingly enough, the facts contained in the replies agreed remarkably well. Briefly, all birds were flushed from green growth, all correspondents described the tail colouring as bright red (or similarly worded) and the body colour as very dark brown or black, and all agreed the bird was small. Some who gave further details noticed that some were not as dark as others, these probably being of one sex while the darker birds were

of the opposite sex. Others saw white in the vicinity of the eye and short thin white stripes running vertically down the back features which I observed some years ago when I made an aquaintance with them at Inverramsay.

THERE is no doubt that the quail which has been sighted by such a number of people is the one for which we are looking. Knowing where the birds have been seen recently, a search can now be made in these areas, probably next autumn or winter, when a number of sightings were in other years.

Though the red-tailed quail puzzle may be close to being solved, further help is required from people who are in a position to watch for this bird next winter. Sightings would be very helpful, especially those made in Southern Queensland, whereupon a search can be made when such information is received. These sightings should be sent to Mr. Casterton or myself, c/- Box 400 Dalby, Qld. (If, by chance, a dead bird is found, or killed during farming operations, etc., it should be preserved in a bottle of methylated spirits and sent to the museum.)

From field observations and the consistent observations of the people who supplied information to our Press appeal, the chances of the quail being a 'colour phase' or a 'subspecies of a known quail' seem very low, and when the eventful day comes to pass, when the quail meets the scientific world face to face, the 'official checklist of the birds of Australia' will probably be richer by one species.

To those who sent information in response to our recent Press appeal, we say a very sincere and appreciative thank you.

Artist's impression of Red-tailed quail.

Gwen Atkinson's Diary

SPRING seems to have been a good season over most of eastern Australia this year and this part of the Goondiwindi district in Southern Queensland is no exception. The country is looking wonderful and there is an abundance of wildlife with nests and young everywhere. We have noticed several unusual birds and animals in the past few months.

20th August:

The men found a koala; they were clearing a paddock of thick scrub with bulldozers and a chain when they noticed the koala run out of a narrow-leaf box sapling as it fell to the ground. Stopping the dozers they chased the koala and soon caught it. It was a fine, big healthy-looking animal and it struggled savagely when caught. The men put it over the fence into the next paddock where it quickly climbed up another box tree. We went out a few days later and looked for it, but could see no sign. This is the first koala we have seen here, though neighbours say they have seen them occasionally; there could be numbers of them in the scrub, large areas of which are still uncleared and rarely visited, and perhaps they are breeding up here as they are said to be in other parts of the State.

31st August:

Plovers have been found nesting everywhere this spring. One Spur-winged Plover nested right on the road in a wheel track, a little to one side certainly, but in a most dangerous position! Each time a vehicle approached she would rise up, wings outspread threateningly, and protect her eggs no matter what size the enemy. We went to see the nest and as we drew near two semi-trailers roared past and then a mob of horses was driven along the road. All this must have really alarmed the Plover, as she had left the nest, and we had some difficulty in finding it, although we knew exactly where it was. The perfectly camouflaged eggs just seemed to merge into the ground. The nest was simply a shallow depression lined with a few small sticks and containing four dark green-brown eggs with black blotches, very pointed at one end and rounded at the other. Later that day a large mob of cattle was driven down the road and still the eggs miraculously survived. However, a few days later we were sad to hear that a truck had run over them. It really was a foolish place to nest with thousands of acres of quiet bush on either side of the road!

Banded Plovers were also found nesting in a crop paddock.

8th September:

Last winter we put narrow strips of oil-soaked sacking around the trunks of the white cedar trees to prevent the hairy caterpillars from climbing up and denuding the trees of their leaves. This morning I was surprised to see a Leatherhead (Noisy Friar-bird) pulling and tugging at the sacking till it got a thread free and then fluttering round the tree till it had unravelled a long oily thread. It then flew off with it and we found a half-completed nest hanging among the leaves at the end of a drooping branch about 20 feet from the ground. More sacking was woven into it, together with strips of bark and other material, till a very neat nest was finished, slightly pointed at the bottom and looking scarcely wide enough at the top to accommodate such a large bird. However, the bird did sit on it for some time, but something must have gone wrong as we did not see any young ones and after some time the Leatherhead started to pull the nest to pieces, flying off with each piece, apparently to some new nesting site. In other years we have noticed the Leatherheads doing this, transferring their nests bit by bit to new places.

12th September:

We had a picnic in one of the paddocks and saw many interesting birds. There was a large flock of White-browed Wood Swallows, some hovering in the air, others feeding on the ground or perched on stumps or dead trees. They are very handsome birds with their bright, rust-red breasts, black throats and white eyebrows. Some were very much redder than others, the duller ones presumably being the females. They kept up a continual chirping.

The lime bushes, which are such a pest to graziers in this area and which are quickly covering acres of good country, are heaven-sent for Wrens. The bushes were alive with the little birds and we found many of their neat grass nests with the round side entrance. The nests are built against the trunks of the lime bushes behind a barricade of thorns which only a wren-sized bird could penetrate. The Blue Wrens are by far the most numerous, but we also have the Blue and White Wrens; and a variation of the Variegated Wren with the red on the back instead of on the wing has been noticed a couple of times. We also found the nest of a Yellow-tailed Thornbill in the lime bushes; the little Yellow-tail flew out of it, a beautifully made nest with its second floor room and side entrance.

Among some wilga trees we saw a Red-capped Robin, a little beauty with his vivid red cap and breast, the wings black with white markings. He was not at all shy and we were able to get close enough to hear the ticking noise which he made, just like a small clock ticking. Sometimes he would even fly towards us, coming quite close. The scientific name of this tiny bird is *Petroica goodenovii,* after an English scientist named Samuel Goodenough. This seems rather an apt name.

16th September:

I saw the Rainbow Birds for the first time this season. There were half a dozen of them near the creek, flying about with gay abandon, calling to each other as if delighted to be starting their summer holidays. The blue, green, gold and bronze colours shone in the sunlight and the two long tail feathers with the bobbles on the end were plainly visible.

19th September:

On the dam were many ducks, Yellow-billed Spoonbills, four Pelicans, a large flock of Straw-necked Ibis and one Glossy Ibis. The Glossy Ibis was smaller than the

Dusky Woodswallow (Artamus cyanopterus) shown ready to fly after feeding young.
Photo: Barry and Joanna Morgan.

others and fed apart from them, though not far away. It was a dark glossy colour, almost black with a tinge of chestnut. The whole congregation of birds rose into the air as we approached (the Glossy Ibis after the others) and circled round for some time, finally landing in dead trees in hundreds, making a lovely sight.

24th September:

A commotion in the tall trees near the house-creek led to the discovery of a pair of Crested Hawks, which have since nested there. They are unusual looking birds, with the crest standing well up on the head, curved beak, bright yellow eye with a black centre. The back is dark grey with splotches of white, the breast very distinctly barred with grey on white and chestnut under the tail. The wings are white underneath with bars at the end which show up very clearly in flight. They played about high up in the tree for most of the morning.

25th September:

The hawks were in the same tree again. Standing underneath we could hear them making a soft clucking noise. They were very active and spent a lot of time fluttering almost upside down at the end of leafy branches with wings outspread, apparently catching insects. About mid-morning they flew off, causing a great commotion among the smaller birds as they did so. They soared round and round, the chestnut colour and the bars on the body and the markings under the wings showing clearly as the sun struck them. They soared higher and higher till they were out of sight.

26th September:

I was surprised to see a bird dive into a small round hole in the bank of the creek. It was a Pardalote, with black and white streaks on top of its head, bright yellow eyebrows and chest and a very persistent song — 'witta witta, witta witta'. Apparently there were babies at the end of the nesting tunnel as a clamour could be heard when the bird flew in. The 'witta witta' of the parent could also be heard from inside the creek bank! I saw three of the little birds entering the hole at different times, though one seemed to be unpopular with the others and may have been an intruder. They would fly down at a great rate, calling loudly, shoot into the hole like an arrow, then after a few seconds out again, perch for a while on a root nearby, then fly swiftly up among the leaves of the tall trees.

29th September:

The Crested Hawks have begun to build their nest. Almost at the top of a tall tree they placed a few sticks on a thin horizontal branch. Both seemed to help with the building or at any rate with collecting the sticks for the nest. They were carefully woven between several vertical leafy twigs till a basin-shaped nest was made. Sometimes we heard the hawks calling with their distinctive 'wheechoo, wheechoo', the accent on the 'whee'. Sometimes, sitting on a limb, they would start with the soft clucking sound and finish with the wild 'wheechoo'. At this stage they never seemed to spend the whole day in their tree — one morning early I saw them fly home; they flew low over the house accompanied by a couple of squawking Galahs, landed in their own tree, gave several loud calls and then one flew straight up to the nest. By the 16th October one of them seemed to be sitting on the nest continuously and it is still doing so (27th October). Some days have been so windy that it is strange that nest and bird have not been blown away, but there it sits surveying the world around with its bright yellow eye, worried sometimes by the Peewees and other small birds who have their nests nearby. We are looking forward to seeing the baby hawks, but don't expect we shall be able to till they leave the nest as it is so high up among the leaves.

Spur-winged Plover (Lobibyx novae-hollandiae). Has sharp spurs on the wings and protects its young fearlessly.

Photo: Barry and Joanna Morgan.

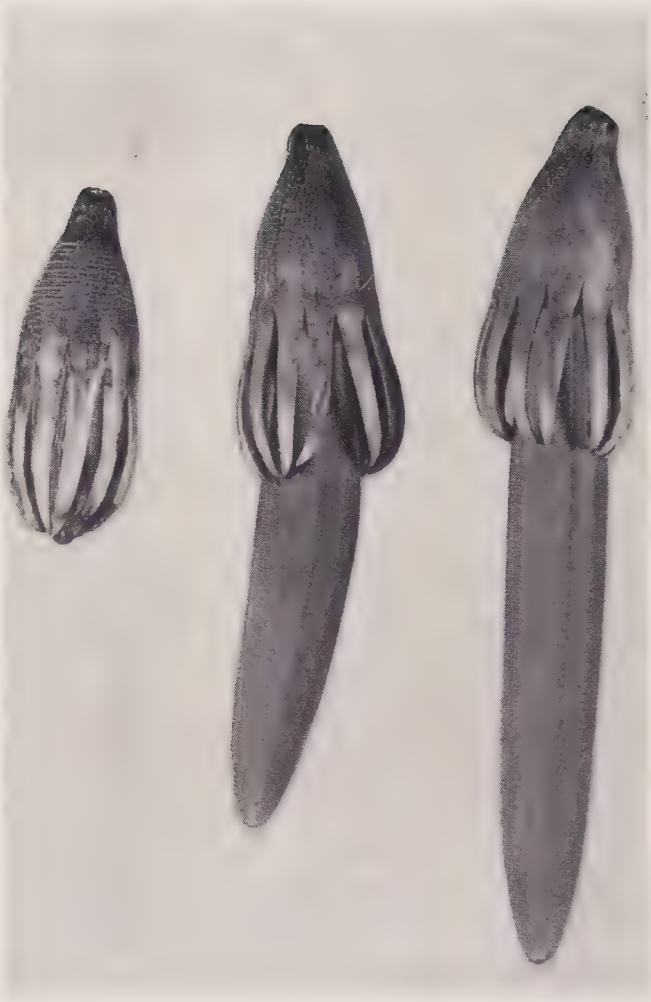
BIRTH OF A MANGROVE

BY BILL JONES

FROM the dark green leafy canopy above, a slender green torpedo-shaped missile plummeted silently down to bury its lower half with a plop in the watery grey mud. A mangrove tree had just dropped one of its young to start a new life on its own — not a latent seed, but a live young plant equipped to sprout a root system and establish itself a few hours after falling from the parent tree. This habit of producing living young is known as vivipary and very few species in the plant world have evolved to produce their young in this specialized way. The lower part of the new plant emerges from the fruiting body and continues to grow without undergoing any period of rest. While still attached to the parent tree the infant plant emerges and lengthens into a long-ribbed, torpedo-shaped body broadened at the lower end. During spring and summer months young plants may be seen on the trees in different stages of emergence from the fruiting body. Examples of vivipary are common among the mangroves which thrive in the low-lying muddy areas along the coast regularly inundated by the tides.

JUST as young fledgling birds and animals are put out by their parents to fend for themselves and to make their own way in the world, so the young plants of the viviparous mangroves are weaned by the simple process of dropping them off to whatever is in store for

A Mangrove Forest.



them below. Those plants falling off at low tide have a chance to anchor in the soft mud, but others falling at high water may be transported back and forth by wind and tide before they finally drift to rest on some mud flat or beach many miles from the parent tree. The young plant is designed to float in an upright position — the swollen root-bearing end pointing down — which enables the plant to take root when the opportunity presents. The mangrove does not drop all of its young plants at once, but only a few at a time over a period during which the currents, winds, and tides change, distributing the young plants over a wide area. Those washed up on beaches or sandy places have little chance of survival as the mangrove is essentially a mud dweller and will not thrive in pure sand. Countless numbers of young plants are shed each year to be distributed by current and tide. Some find a foothold on newly formed mud banks, others replace natural losses — however, many perish on rocky surfaces, sandy beaches and in other unfavourable situations.

Stages in the development of young mangrove seedlings.

THE MIGRANT CURLEW

Observations made on Rowe Bay, Townsville, North Queensland

BY ELIZABETH KENNEDY

FOR a number of years I have observed the various wading birds which visit the shore and tidal flats of Rowe Bay, Townsville, North Queensland. The migrant waders are especially interesting, because they have migrated to Australia to spend the spring and summer months before they depart to the northern hemisphere during late March or early April. The birds breed in the northern hemisphere.

In October, 1963, I observed a flock of Curlews on the shore of Rowe Bay and took some colour pictures. There were eighteen birds and they appeared to be resting before continuing their journey south. Some of the birds were probing in the mud for food, while others just stood or preened their feathers. Previously I have only observed Curlews in ones and twos. This flock was very shy and wary and did not like being observed. After the photographs were taken, the flock objected to having a movie picture taken of them and they rose, uttering their rather mournful cry, and departed to the south. The following day I observed five birds, and after that only a solitary Curlew on several occasions.

THE Curlew, Sea Curlew or Australian Curlew (*Numenius madagascariensis*) is a migrant from north-eastern Siberia — the birds build their nest in a

hollow in the ground which is lined with grass. Four eggs are usually laid. Both parents take turns at incubation. The young Curlews hatch after about four weeks. At about six weeks of age the young birds can fly. The young Curlews are different from their parents, being sandy in colouring with dark brown markings. Full adult plumage is not attained until the second season after hatching. The adult Curlews are greyish-brown with darker mottles above; below they are lighter. Their name, *Numenius* — neos, meaning new, and mene, meaning moon — is derived from the crescent shape of their seven-inch bill. The male Curlew is smaller than the female — males 21 inches, females 24 inches.

Food is caught by probing and consists of crabs and other marine life, and they are also said to eat berries.

An occasional bird may remain in Australia for the autumn and winter, for some reason or other, when its fellows migrate, but the majority depart, flying the long journey back to the northern hemisphere, to mate, nest and breed during the northern hemisphere summer, and so the cycle continues.

Curlews at Rowe Bay, Townsville.
Photo: Elizabeth Kennedy.

Observation Page

from

MICHELE MERCER
(AGE 9)

A Child Asks—

WHERE will they go? I am worried about the wildlife living in swamp land lying between Ballina and East Ballina. It is about 60 acres big and it is to be filled and made into a sports ground.

This is good news for people, but very bad news for creatures who are living there already. On the way to school I see Herons, Ibis, also Redbills and Plovers (who seem to own the swamp because they are so bossy). Seagulls visit the area in stormy weather, also Pelicans. There are lots of Sandpipers and Hawks, too. There are hundreds of mice, frogs, grasshoppers and other insects.

One morning as I was going to school there was a bushfire in the drier parts of the swamp. In the afternoon the Ibis were pecking for dead frogs and insects. The next day, instead of white Ibis, we saw black Ibis, because they had soot all over their feathers.

When we take a short cut across the swamp the Plovers shout rudely at us to stay away from their nests.

All these creatures live busy, useful lives, but when we take their land they will have to find new homes.

Pelicans at Noosa, Queensland.
Photo: W. D. McKenzie

Alarm In The Night

BY LOIS SOUTHERN

BUSH nights are so quiet that people wake easily at any noise. If their dog takes no notice of it, they know there is nothing to worry about, and quickly go to sleep again. That is, of course, if he has been properly trained not to make a fuss about nothing, and most country dogs are like that. People keep them for use, not just for fun, but I don't think they are any less fond of them for that. When men and dogs work together it makes a very strong tie, my father says.

Our dog Blue was the usual cattle dog people keep in the country, and he had the usual name. This particular night he began to bark at about 3 a.m. My brother and I heard him first — we slept at opposite ends of our long verandah. He barked loudly, and with great excitement. The barks all came from one direction, so whatever had alarmed him was staying in the same spot, not moving about.

We waited a little while, listening. It couldn't be a snake, because they come out at night only in late summer. It wasn't likely to be a stranger, because we were such a long way from the main road. Perhaps one of the cows had broken into the vegetable patch, a thing that infuriated Blue as much as it did us; but the direction didn't seem right for that.

Every now and then he paused, quite breathless. Then we could hear nothing but the usual soft noises of the night-crickets, and a distant owl that said 'Boo-book,' very quietly, and then, after a decent interval, again, 'Boo-book', as though he had a wrist watch and was timing himself carefully.

Then Blue would get his breath and start again. It was plain that he was shouting at us, 'Come and *see!* Come and *see* what I've found! I don't know what it is, but you will. Come and see-e-e! Come and see-e-e! Wuff! Wuff!'

Father and Mother were awake too. Father called out: 'What about taking a look, Harry?'

Harry was already out of bed. He said to me: 'Coming, Sis?'

I shouted: 'Rather!' because, although I was only eleven, I never let Harry go anywhere without me if I could help it. Harry was thirteen.

'Call me if necessary,' grunted Father. But I think he was practically asleep again. We put on our coats and shoes, and crept down the steps. Blue came bounding up, wild with excitement.

THEN we heard a commotion in Auntie's room. She was our English auntie, Father's sister, and had come out on her first visit. She thought everything was very dangerous, and that Father was far too casual. She was putting on her coat and shoes, and abusing Father at the same time.

'Henry, you're not letting those children go out alone! Why, it might be a wild animal!'

'Our animals are not wild,' said Father, chuckling, 'unless you mean the rabbits.'

Auntie was not pacified. 'It might be a burglar,' she said, as if that was the only kind of wild animal she could think of at the moment. I could hear Mother laughing then.

'You're not in London now,' snorted Father. He was always teasing her.

'Wait for me, children,' called Auntie, in her most aunt-like voice.

This was hard on Blue, and hard for us too. He kept dancing round us, saying plainly, 'Come and see — come and see!"

Auntie was a long time getting ready, because she always wore gloves, stockings, and veil, even at night, to protect herself from mosquitoes, flies, sandflies, midges, and all other insects. But at last she came, carrying a beautiful torch, much bigger than ours.

Harry said: 'Come on, boy — show us!' and Blue dashed away in the direction from which he had come. His hair was stiff on his neck, and his tail stood up with excitement. The three of us followed him down a rough track into a little gully at the back of the house, Auntie prodding carefully about her with her stick. This gully was our rubbish dump, where we threw the empty tins and broken china that everyone collects. Every now and then Father would spade earth down over it, but he hadn't done this recently.

Suddenly Blue stopped, and began his furious barking again, dancing his war dance round some object beside the path. It was partly covered by a small tangle of old wire-netting, and though we played a torch over it again and again, we couldn't make out what it might be. Auntie kept saying, 'Be careful!'

It moved. It was alive. But it seemed just a dark mass, with a shining metallic head that waved from side to side, but made no sound. It glittered strangely when it caught the light. I shivered. It looked like a dragon out of a fairy tale. Blue kept up his wild barking and prancing.

Harry said sharply, 'Lie down!' And Blue stopped at once, though he nearly exploded with the suppressed barks inside him.

AUNTIE, still saying 'Be careful!' and 'Keep back, children!' knelt down to get a closer view. I knelt beside her. In a flash we recognised the shining object — no dragon's head, but a sixteen-ounce Marmite tin. The body that carried it and waved it in the torchlight was a brush-tailed possum, with its head fast inside the tin!

We all saw what had happened. The little fellow had liked the smell of the Marmite so well that he'd thrust his head down into the tin to lick it, and then found that he couldn't get out again. He couldn't see, probably couldn't hear much, and was quite helpless. Evidently he could breathe quite well, because it was a good while since the barking had first begun, and he was still very much alive. It was a good thing he had stumbled into the wire-netting, or I think Blue would have finished him off before we arrived. As it was he couldn't quite get at him.

It was such a surprise that we burst out laughing. Then we remembered that it wasn't much fun for the

possum. Harry impulsively thrust his hand into the tangle of wire and caught hold of the tin, hoping to pull it off. But the possum must have thought he was being attacked by enemies he could not see, and he scratched him viciously.

We decided to put Blue on the chain and wait till daylight, which wasn't far off. It would be easier then to free the possum without hurting either ourselves or him.

We thought he couldn't move far, but actually he'd gone for quite a little walk when we found him in the early morning light. Harry had worked out the best way to free him. He took an old coat of his, and threw it over the possum. Then he got me to hold it firmly in place, so that the possum couldn't scratch or struggle, while Harry gently worked the 'tin hat' over one of its ears. When that was free the little chap did the rest himself. He pulled back, and the rest of his head came out quite easily.

He was so exhausted by his experience that when Harry lifted the coat he just crawled a few feet away into a large rosemary bush and went straight to sleep, with all of us looking at him.

WE took Blue off the chain, showed him where the possum was, and told him everything was all right, and that he mustn't touch. He looked very disgusted, but he managed to obey.

All day the possum lay there, and though we put a bowl of water beside him, he didn't stir. Auntie sat beside him with her camera. She wanted to get a good photograph when he came out. She put on a large hat with a veil (for flies), rubbed lotion on her legs (for mosquitoes), and settled down with her knitting for the day.

Father saw her through the window as he was going to work. 'The spirit that made old England,' he said to Mother, slyly. We all laughed in the kind way people do when they are fond of the person they laugh at. I think we liked her better because she made us laugh.

At the end of the day she had nothing to show for her waiting, except about a yard and a half of knitting because the possum slipped out at dusk, without her noticing, to join his mates in the tall trees.

But after that Mother always put the lids firmly back on the tins before she threw them out.

Photo: Barry and Joanna Morgan.

Brush-tailed Possum (Trichosurus vulpecula). One of Australia's most common nocturnal marsupials.

Observations and our Coins

BY KIT McMULLEN

IT is announced that Australian decimal currency coins each will depict on the 'tail' side a native animal or bird: 1 cent, the feather-tailed glider; 2 cents, frilled lizard; 5 cents, echidna; 10 cent, lyrebird; 20 cents, platypus; 50 cents, Australian coat-of-arms with emu and kangaroo.

From a recent talk by Myron D. Sutton, a visiting American who is Assistant Chief of the Park Service Division of International Affairs:—'I like to ponder a question recently asked by an American historian, "How do we know it is us, without our past?" It is not enough to sit and simply be inspired. There are always pressures of destruction. And what is gone is gone forever. We Americans, in our haste to conquer a land, conquered the passenger pigeon and other birds. No one will ever see them alive again—and our sorrow is deep and profound. We must guard against a repetition of that . . .'

This year a Federal organization was set up to consider conservation on a national scale. It is headed by Sir Garfield Barwick, Chief Justice of Australia. One of its active leaders is Francis Ratcliffe, famous for his 'Flying Fox and Drifting Sand' and his work with myxomatosis on rabbits when he was Chief of C.S.I.R.O. Division of Wildlife Research.

The above paragraphs may seem unrelated, but there is a linking significance. Would we care to be reminded by every coin in our currency of native creatures threatened with extinction? Why, indeed, the omission of the koala, when to many folk it represents Australia almost equally with the emu and kangaroo? Perhaps it was not chosen because, in the case of the koala, its continuance in the wild state is precarious.

Those which *will* decorate our cents could too easily follow the same trend, until we would be carrying in our pockets and purses a collection of memorial plaques. For example (no prize awarded)—

Feather-tailed Glider's Farewell
Nail up a one cent on a tree
And there, too late, remember me.

The kangaroo and emu on our national coat-of-arms form its distinctively Australian feature. 'How do we know it is us' without our kangaroo and emu! There are still plenty of those around, but so were there once in America passenger pigeon flocks numbering countless thousands.

The third paragraph is cheerful because it indicates *awareness of need* and *planning for action* on the Federal level.

Conservation, of course, covers far more than preservation of wildlife, which is just one aspect. For all of us, country and city dwellers alike, conservation in one field or another is of vital concern.

THE GREY SWIFTLET

BY H. C. HAYES

OF the five species of Swiftlets (Family *Micropodidae*) occuring in Australia four are seasonal visitors.

The Spine-tailed Swift (*Hirundapus caudacutus*) and the Fork-tailed Swift (*Micropus pacificus*) visit Australia during the Spring and Summer months, travelling as far south as New Zealand.

The Edible-nest Swift (*Collocalia esculenta*) and the Uniform-Swift (*Collocalia vanikorensis*) are credited with occasionally visiting the Far North of Australia. The only permanent resident of the five is the cave-dwelling Grey Swiftlet (*Collocalia francica*) and the only recorded breeding place of the species is on Dunk Island where it nests in caves.

What is known of the breeding habits of this bird we owe to that great writer and naturalist, E. J. Banfield, self-styled beachcomber, who lived for many years on Dunk Island, and is buried there.

Banfield aptly described the bird as 'delicately formed, sober in tint, with a fluff of grey at the base of the tail, short of beak and woefully lacking in leg.'

No doubt colonies other than those on Dunk Island were known to him, as he had an intimate knowledge of the islands along this part of the coast. One such colony of Swiftlets was discovered by Mr. John Busst, the artist of Bedarra Island.

Bedarra Island, habitat of Grey Swiftlet.
Photo: L. Webb

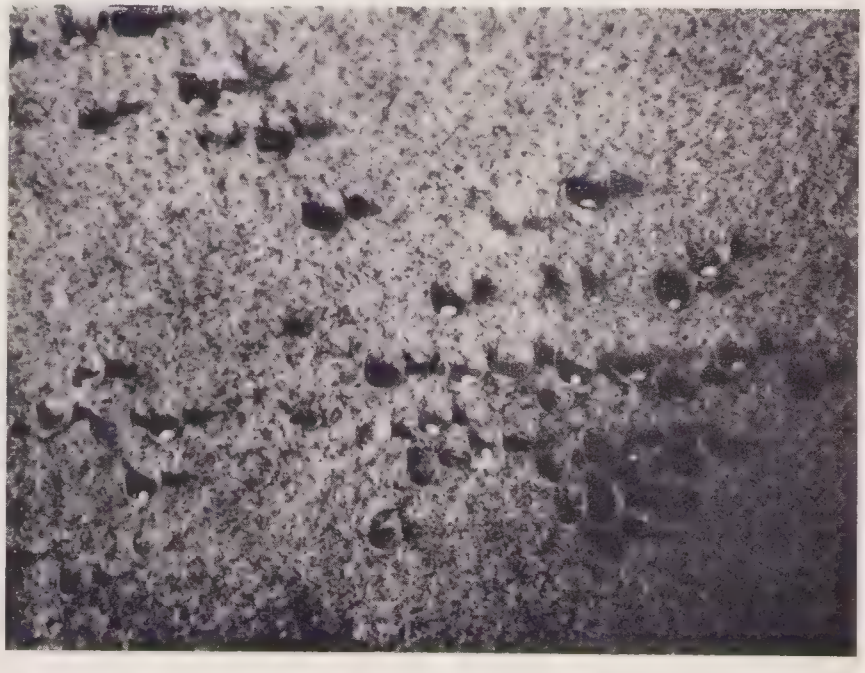
Grey Swiftlet nest on cave walls, Bedarra Island.
Photo: L. Webb

THE Swiftlets' cave is formed by a number of granite rocks of various sizes piled against the shelving and slightly concave face of a huge rock some sixty feet in diameter. The cavity so formed is about twenty feet high and thirty feet long. An opening in the roof at the northern end, and another at the southern end opening towards the sea and a few feet above the water, enables the birds to enter from either end.

In the centre of the cave and opposite to the nesting area which is confined to the concave face of the large rock is a window-like opening so conveniently placed that the observer can see the contents of every nest.

As the cave is seldom visited the birds were very shy at first and the whole colony rose to circle overhead, every bird joining in a chorus of shrill protesting cries. However, if the intruder at the window-like opening remained quite still for a time the more venturesome birds would timidly return to the nest.

The colony contained between 150 and 200 birds. The shallow nests which averaged about 2 inches wide were composed of the terminal twigs of the Casuarina, with a few leaves and feathers interwoven. The material is cemented together with a glutinous substance made from the birds' saliva, giving the nests a plastic-like



hardness. A thin lining of feathers intended to make the interior nice and cosy are robbed of much of their natural softness by the hardness of the glutinous secretion used to stick them to the side of the nest.

Sufficient building room enabled the greater number of nests to be attached singly to the rock. The weakest link in the chain of building operations facing the birds seemed to be the fixing of the nests securely to the smooth rock face. As evidence of this we recovered several otherwise sound and apparently new nests from the floor of the cave.

ONE pure white egg to each nest appears to be the rule and they average about threequarters of an inch long by half an inch in diameter. No doubt the brief but hectic fights which frequently take place between the birds would dislodge an occasional egg from the shallow nests.

Three unbroken eggs were recovered from the floor of the cave, and it is a miracle how they could have fallen from such a height without breaking. The floor was covered in places by a fine powdery guano.

At our first visit on the 27th November, 1950, we counted 45 eggs and one very young bird.

After I left the island, Mrs. Busst, who has taken a keen interest in the colony of Swiftlets continued to furnish me with the following counts:

Dec. 16th 1950 — 64 eggs — 17 young birds.
Dec. 27th 1950 — 110 nests — 57 eggs — 12 young birds.
Jan. 1st 1951 — 57 eggs — 10 young birds.
Feb. 6th 1951 — 6 eggs.
Mar. 14th 1951 — 1 very young bird.
Jan. 11th 1962 — 128 nests — 40 eggs — 30 young birds.

The Grey Swiftlet is evidently a firm believer in the adage that 'the early bird catches the early worm'. In the dim light of early dawn they would be scouring to the treetops of the jungle on the mainland five miles North of Dunk Island.

Nearer home the evening meal is delayed till the last minute.

On Bedarra Island they regularly gathered along a tree-lined pathway leading down to the beach for the final gorge before going to bed. At dusk the birds would appear as a seething dark cloud a foot or so from the ground 'taking toll of insects that sport boldly in the dark and in an instant shoots over the hill and down through the gloomy jungle to its quarters, there to thread its way along crevices a hand's breadth wide and to alight without hesitation at the edge of its nest among hundreds of others on the roof of an obscure dormitory'.

Nests of the Grey Swiftlet. Photo: L. Webb.

Funny Fishes

By ARTHUR G. MATHEWS

Sea-horse on fibrolhos coral.
Photo by A. Mathews.

SEAHORSES have always intrigued me, but it wasn't until I saw some live ones in a marine aquarium that I decided to find out more about these little creatures. What I learned was most interesting and enlightening.

The first thing I discovered was that a seahorse (Hippocampus sp.) is a true fish, but perhaps a more unfishlike fish would be hard to imagine. Really it is more like a chess piece than anything else.

It is a small marine fish with a body enclosed in bony rings (the skeleton is on the outside) and has a small mouth at the end of its tubiform snout. The usual gills of fish are found in the usual place at the side of the head.

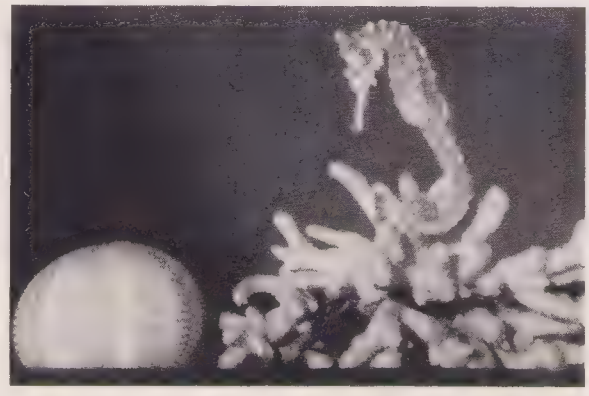
Throughout the temperate to tropical seas of the world some fifty species are known, ranging in size from an inch or two to a foot long, and are closely allied to the Piperfish family.

The caudal or tail fin is missing and instead, the tapering tail is prehensile. It can be curled round stems of seaweed or pieces of coral or other suitable anchorage.

Movement through the water is very slow as progress is made in a more or less vertical position, propelled by the rapid undulations of the small dorsal and pectoral fins.

I guess it would be stretching things a bit too far to suggest that the seahorse is allied to a kangaroo but it does have a pouch. In this case the male has the pouch and the female lays her eggs into it and then leaves the male to 'carry the babies'. This male oversight of eggs is reasonably common among several varieties of fishes.

Sea-horse on coral with sea-urchin shell.
Photo by A. Mathews.



THE general habit of hanging onto weeds with its tail tends to conceal the seahorse from its enemies.

Many women are joining the ranks of skin-divers and underwater-explorers and are taking a keen interest in marine natural history. So it is little wonder that

Continued on page 30

BOOK REVIEW

The Birds Outback

ALL birders, from the casual bird lovers to serious students of ornithology, will welcome *THE BIRDS OUTBACK,* the second recording of bird calls, with commentary, made by the New South Wales Gould League of Bird Lovers.

The first, *THE BIRDS AROUND US,* introduced by Alec Chisholm, gave us coastal birds, sometimes calling in Sydney dialect, yet still recognisable to anyone familiar with the same species in South East Queensland.

Mr. P. E. Roberts introduces the outback birds in a winning voice that expresses strong affection without sentimentality. More than half of these birds are also found in our coastal areas and yet still more we know as caged birds, so that this record is also of use to those on the 'outside'. These recordings do have their uses other than through the pleasure they give.

Some birds are shy and some birds stay in the high canopy of forests, making it difficult for the observer to see them well, and so identify them positively. For instance, I have never consciously seen the Pallid Cuckoo, although I know it to be in the area covered by my distribution chart. Listening to the call of this bird on *THE BIRDS AROUND US* convinced me that it is a regular visitor. I know it well. A school Bird Club in another part of Queensland reported an identical experience with the same bird. Knowing where to look and what to look for is most helpful knowledge for the bird watcher.

I HAVE no criticism to make about the actual recordings which seem to be wonderfully true. Of course, there are certain calls that have more appeal for me as others will have for people more familiar with different birds. Undoubtedly, the most thrilling call for me is that of the Bush Curlew which I want to repeat over and over. It stimulates nostalgic memories of early childhood on the outskirts of Brisbane in the Twenties and again of the lovely Caloundra of the Forties when my own children were small. The habitat of my childhood curlews is now a sea of houses and although we see Bush Curlews in Caloundra sometimes still, feeding under the street lights on Wickham Point, the sound of their haunting call is a rarity for us.

The presentation of *THE BIRDS OUTBACK* is an improvement on the earlier record. The sleeve is more attractive with a bolder title in red and showing eleven birds in excellent colour photographs. There is also a printed supplement with five photographs in sepia tones and useful information on each bird. This includes the scientific names, alternative common names, measurements, description of plumage and voice, as well as relative information on size of flocks and habitat, etc.

These records can be recommended to anyone interested in Australian birds and we look forward with pleasure to the release of more such recordings.

Kathleen McArthur

Funny Fishes — *Continued*

many women spend so much time searching for these creatures. Even when a skin-diver knows what she is looking for and where to look, the task of locating specimens is by no means easy, plentiful and all they are in the waters along the coast of Western Australia near Perth. Numbers are found around the piles of the wharves that jut out into some more sheltered parts of the coast.

It is fascinating to watch the bright little blue eyes of seahorses as they cling to some firm object. They are forever on the move searching for minute food. I've never quite made up my mind whether they move their eyes independently like a chameleon or whether they are co-ordinated.

The hippocampus pictured here is 7½ inches long from tip to tip but only 3½ inches long in the swimming position. It was found in the sea quite close to Fremantle only a few weeks ago.

Yes, the seahorse is a funny fish—but nevertheless, a fish.

BILL JONES ANSWERS YOU

Sir,

Could you please tell me to which families of marsupials the Numbat and Marsupial Mole belong? Also could you tell me how to keep Slow Worms? I have had my Slow Worms for several days and I keep them in an aquarium partly filled with moist sand. I am feeding them on worms and have a supply of water for them. Would these breed in captivity? Best regards to yourself and all the staff of 'Wildlife' magazine.

WILLIAM ENGLAND.

Dear William,

The marsupial mole (Notoryctes typhlops) *belong to the family* Notoryctidae *and the Numbat or Banded Anteater* (Myrmecobius fasciatus) *to the family* Dasuridae. *Regarding your second question as to how to keep slow worms, I would suggest you continue with your present method, adding some leaf litter and chips to the surface of the soil, to provide extra cover. Some species of legless lizards or slow worms as they are often called live on insects and white ants (termites), so a few of these might be used as an addition to the diet of worms. I had not heard of these interesting little reptiles being kept as pets, and see no reason for their not living and breeding in captivity provided they are given sufficient food and a home with conditions similar to the one from which they came. Thank you for your good wishes to 'Wildlife'.*

Dear Mr. Jones,

I would like to comment on an article in the March edition of 'Wildlife' 'Bill Jones Answers You' to question asked by James Stuart.

I have observed a large flock of approximately 300 black swans, from full to half-grown, on the salt water on the northern side of Jervis Bay, N.S.W.

These swans lived here for about six months before most of them went away; always when out fishing in my boat, one can see a dozen or so swans flying low to the water across the bay.

Thanking you for a fine magazine in 'Wildlife'.

Yours faithfully,

RAY MITCHELL.

Dear Ray,

Many thanks indeed for your interesting comments re *the Black Swans observed on Jervis Bay. Since receiving your letter I have seen much the same thing on a salt water bay near St. Lawrence, North Queensland. Several swans were swimming on the bay just offshore.*

Dear Mr. Jones,

Could you please tell me the identity of the beautiful insect in the enclosed colour slide? Unfortunately I haven't a lens on my camera to take photos closer than 2·7 ft., but the detail shows up fairly well under a little magnification and the tape measure pinned beside it will give you a fair idea of its size—the wing span was about 8¼ ins. I found it drowned in a stock trough early one morning last April, or possibly late March, and it hadn't been there just before sunset the previous day, so it must have been a dusk or night flier. When the wings were folded, the shorter green 'leaves' completely covered the orange part of the wing, making a very efficient camouflage against a leafy background.

I remain,

Yours faithfully,

(Mrs.) M. G. CHENHALL.

Dear Mrs. Chenhall,

Thank you for your letter and the enclosed colour slide. The insect shown in the colour slide is one of the large Phasmids. The Phasmid group includes the Leaf and Stick insects, so called because of their close resemblance to a brown leaf or a dead twig. Some members of the Phasmid group, although very colourful in flight, are quite drab when motionless and blend in perfectly with their surroundings. Phasmids are all leaf eaters—some species at times breed up to plague proportions and when this occurs all trees in their path are denuded of leaves.

AN IMPORTANT ANNOUNCEMENT

It is with very great regret that we have to announce that it seems only too likely that only one further issue can be produced. This has come about partly because of the cost of production, but also because *WILDLIFE* has not found enough support and subscribers to make it a paying proposition. Other factors also enter, but these are basic.

If you have been a subscriber, you have seen our previous issues, and perhaps you have been one of the number who have written to congratulate us on producing a magazine which is much needed. If you have not been a subscriber, we hope that this issue convinces you that we have here a splendid magazine which should, if possible, continue.

We hope that the final issue of Volume II, later this year, will be an authoritative statement of the situation confronting Australia's wildlife — a very serious situation. *WILDLIFE* has aimed at making this situation known to more people and at emphasising the need — the urgent need — for conservation, for National Parks and wildlife reserves and for a new attitude towards the country for which we are responsible to future generations and to the world.

Do you support our work? Will you write to us and tell us so? Will you help us, if it should be possible for this magazine to continue?

Only your support and encouragement can give us hope that the magazine may carry on its work. We are not announcing the end of *WILDLIFE* — we are hoping that we are only going into abeyance until it may become possible to produce the magazine on a stronger financial footing.

It remains to pay tribute to our present supporters, our helpers, and above all the contributors of articles and photographs, whom regrettably we have been unable to pay. The magazine has been run largely on a voluntary basis — eighteen hundred copies of each issue have been distributed free to primary schools — and we feel that the magazine's issues so far stand as a lasting monument to the willingness of many people to help with an enterprise which has been non-commercial and idealistic.

Judith Wright McKinney

PRESIDENT,
WILDLIFE PRESERVATION SOCIETY OF QUEENSLAND.

AIR WEIGHT
CORRESPONDENCE FOLDERS
SHOWING AUSTRALIA'S
HIBISCUS HETEROPHYLLUS

10 for 12/6.

100 for 100/- with envelopes.

Available from

Kathleen McArthur

ORVIETO TERRACE,
CALOUNDRA, Q.

HIBISCUS HETEROPHYLLUS, found in Coastal New South Wales and Queensland, is one of our many species of native hibiscus. It was first collected in 1803 on the Hawkesbury River and the first painting of it, from a plant grown in London, appeared in The Botanical Register Volume I. 1815.

Companion folder — Hibiscus Splendens — also available.

An invitation to join

THE WILDLIFE PRESERVATION SOCIETY OF QUEENSLAND

President: Miss Judith Wright.
Secretary: John Irvine, G.P.O. Box 1173P, Brisbane.

Subscription: 30/- per year — includes four issues of this magazine.

CHILDREN: You can become student members on payment of 2s. 6d. per annum. Six book prizes will be given each quarter for the best short accounts of any natural history project or observations you have made. Send your entries to the Editor, Wildlife, G.P.O. Box 1173P, Brisbane.

JACARANDA POCKET GUIDES 14/6 each

'There is in Australia a great dearth of authoritative books on natural history topics, and the Jacaranda Press is to be commended for the part it is playing in publishing such works.'

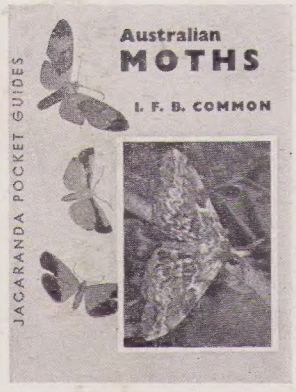
Australian Journal of Science

The Pocket Guides are excellently produced descriptive reference works, illustrated in colour and black and white for easy identification, with notes on distribution, life history and fascinating details on habits and development. They fit the pocket physically as well as financially.

TREES OF AUSTRALIA
H. OAKMAN

SHARKS
PETER GOADBY

MOTHS
IAN COMMON



FRESHWATER FISHES
GILBERT WHITLEY

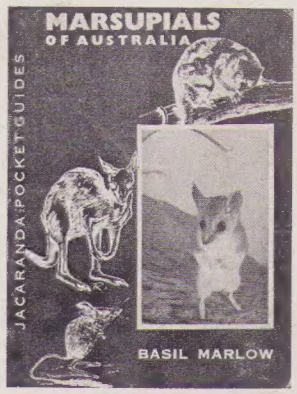
MARINE FISHES Vol. 1
GILBERT WHITLEY

MARINE FISHES Vol. 2
GILBERT WHITLEY

SHELLS OF THE AUSTRALIAN SEASHORE
D. F. MCMICHAEL

INSECTS
EDGAR RIEK

MARSUPIALS OF AUSTRALIA
BASIL MARLOW



SNAKES AND LIZARDS
DAVID MCPHEE

BUTTERFLIES
IAN COMMON

SPIDERS
BARBARA MAIN

BUSH BIRDS
ALLEN KEAST

published by

THE JACARANDA PRESS

BRISBANE
73 Elizabeth Street

SYDNEY
41 Military Road,
Neutral Bay

MELBOURNE
38 Walsh Street